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CONSTRUCTIVISM THROUGH SOCIAL PRESENCE AND SWIFT TRUST: FACILITATION AND COLLABORATION WITHIN ONLINE LEARNING NETWORKS

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Abstract

This paper links constructivism to computer-mediated communications (CMC) used in online learning. The communication here is primarily asynchronous supporting a group learning experience through online discussion. The theories of behaviorist and constructivist learning are contrasted to demonstrate the pedagogical context, and the preference for constructivism. Constructivist teaching/learning principles are presented as they apply to CMC. Social presence and swift trust theories are presented and compared to the needs of online constructivist learners. Finally, the offer is made that social presence and swift trust will contribute to the success of online teaching because they enhance the constructivist method. The paper describes a process of evaluation and validation of these constructs and how they are applied to actual online courses.

Keywords: Constructivism, social-presence, swift-trust, online-learning, pedagogy

Introduction

Behaviorist theory suggests that a student's learning is the result of acquiring information and displaying that knowledge in performance. A modern metaphor is the information-processing model. A second view of learning is based upon the notion of knowledge construction. Constructivists view learning as having been a modification of experiential memory to be more consistent with the present experience. This paper will show that constructivist views are useful in online teaching though discussion.

A definition of constructivism states that people create knowledge from the interaction between their existing knowledge or beliefs and the new ideas or situations they encounter (Airasian and Walsh, 1997). This paper discusses constructivist learning and teaching in the context of computer-mediated communications (CMC) using social presence theory and swift trust theory to predict the usage and outcomes of CMC as a place of learning. By using some CMC features and modalities, increased levels of both social presence and swift trust are predicted. The indicators of social presence and swift trust (discussed below) are the basis for a good constructivist-learning context. Social presence supports the individual's cognitive growth through interaction and satisfaction. Swift trust, a property of group interaction, supports the group socio-cultural growth and learning support.

Social presence theory is defined as that sense of 'intimacy and immediacy' or 'we are together' feeling, leading to increased enjoyment, involvement, task performance, persuasion, and socio-emotional interaction (Lombard and Ditton, 1997). Constructivist learning theory suggests that these same qualities of the individual's experience lead to greater learning than more objectivist/directed teaching methods. For the online class members to construct meaning from interaction among participants, increased social presence will serve as the generator of increased learning and satisfaction. An increase in the participants' level of social presence would be expected to lead to increased learning on their part.

Swift trust theory is related to social presence theory such that group interaction is predicated upon initial expectations of involvement and effective task performance. These zero history groups will experience swift trust from participant expectation

of trust and continued social activity to maintain trust. An increase in swift trust would be expected to increase satisfaction with the process and instructor.

Theory

Constructivism

A pedagogical assertion that students learn by constructing knowledge through group interaction (Roblyer, et al., 1997) is the foundation of online learning. Within the online learning context collaboration with the class using a discussion forum allows the student to construct meaning from exploration of ideas put forth by classmates. Students create knowledge from the interaction of their existing knowledge and beliefs with the ideas put forth in the class discussion (Airasian and Walsh, 1997). The teacher uses facilitative techniques to foster that discussion among all members of the class. The directed collaboration of the class or sub-groups of class members allows each student to test current beliefs against classmates' beliefs.

Constructivism is generally credited to Jean Piaget (1896-1980). Berger (1978, p.55) notes: "In Piaget's view, intelligence consists of two interrelated processes, organization and adaptation. People organize their thoughts so that they make sense, separating the more important thoughts from the less important ones as well as connecting one idea to another. At the same time, people adapt their thinking to include new ideas, as new experiences provide additional information. This adaptation occurs in two ways, through assimilation and accommodation."

There are three reasons for basing teaching on Piaget's constructivism: It is a scientific base explaining human knowledge, it is the only theory that explains children's construction of knowledge and it informs educators of distinctions on how different subjects should be taught (Kamii and Ewing, 1996).

Lev Vygotsky's socio-cultural theory parallels the constructivist notion. He declares that social experience shapes thinking and thus individual cognition occurs in a social situation. The group interaction, he stated, is part of the learning process of individuals who jointly construct meaning from peer and teacher collaboration (Jaramillo, 1996).

Social Presence Theory

Social presence theory predicts that CMC can create in users a sense of intimacy and immediacy. When people participate in communication they can assess how much they feel that they are present in a real setting. Face-to-face is considered the highest level of social presence and some forms of asynchronous communication result in the lowest level of social presence, in as much as the social presence can be quantified (Lombard and Ditton, 1997). Rice (1993) concluded that social presence has two dimensions, intimacy and immediacy, described by interpersonal versus mediated, and asynchronous versus synchronous. Researchers can use these two dimensions in an online class to measure the progress of group interaction from initial exploration to substantive teamwork. Social presence in the group discussion would be expected to positively correlate to perception of learning by group members.

Swift Trust Theory

Swift trust is defined in context of temporary teams as that measure of trust initially present in formation of a zero history team. These teams must swiftly form relationships and roles to perform the task necessary in the limited time allotted. "... the trust that unfolds in temporary systems is more accurately portrayed as a unique form of collective perception and 'relating' that is capable of managing issues of vulnerability, uncertainty, risk, and expectations. These four issues become relevant immediately, as soon as the temporary system begins to form." (Meyerson, et al., 1996, p.167) All four parameters are related to social presence and information richness. Rice and Love (1987) found that one third of messages in a CMC forum contained socio-emotional content. However a large number of participants were inactive non-contributors. They found that participants did not change their percentage of socio-emotional content over time implying that the initial active participant group was stable. The implication for swift trust is that a social presence established early in the semester to draw in potential non-participants will promote a 'swift trust.'

Constructivism Online

Facilitation

Although most constructivist classrooms feature active, social and creative learning, different kinds of knowledge invite different constructivist responses, not one standard constructivist approach. How can a teacher create appropriate targeted constructivist responses to learners' difficulties? One approach to the challenge recognizes that different kinds of knowledge - inert, ritual, conceptually difficult, and foreign - are likely to prove troublesome for learners in different ways. It is the search for understanding that motivates students to learn. When students want to know more about a topic, idea or discipline, they put more cognitive energy into investigation and discussion (Brooks and Brooks, 1999). CMC allow the facilitator to match the kinds of knowledge sought to methods of construction, such as group discussion, or role-play, or critical review because of the asynchronicity and inclusiveness of the medium.

In a study comparing students' preferences and perceptions of constructivist-style teaching environments, students preferred methods of being taught science did not occur in any courses taken (Cannon, 1997). Students evidently do not regard discussion as learning. Having mandatory discussion as part of the course grade seems fair to them, but students do not regard the instructor's evaluation of the discussion content as reflective of their learning. Students as well as instructors have adjustments to be made to recognize learning processes and outcomes (Nulden and Hardless, 2001).

Those students who experience high levels of communication with other students and with their professor were most likely to judge the outcomes of the online courses to be superior to those of traditional courses (Hiltz, 1990). It is the activity that is satisfying and perceived superior. With the activity comes construction of knowledge. CMC seems the ideal context to engage students in the activity to the fullest extent possible. The availability of interaction anytime and anywhere increases the perception of superior instruction. It is a mixture of asynchronous thoughtfulness and synchronous spontaneity.

Collaboration

In the classroom, students and teachers seek credibility and emerging understanding of the content of the curriculum. Each participant actively seeks to learn about themselves, the other group members and the content of the course (Brooks, 1990). "We can only evaluate whether meaning is shared by testing the compatibility of our individual meanings: exploring implications, probing more deeply... We probe at deeper and deeper levels to determine where or if our understandings begin to diverge" (Duffy and Cunningham, 1996, p171). The traditional class provides a lively interaction among students and teacher, but it is too quickly over and may easily not include everyone. It is the asynchronous CMC that can extend the discussion at the discretion of the students and include all students at the insistence of the instructor. The probe of shared meaning can extend until the CMC discussion group has reached agreement.

One study found that students working collaboratively were more interested in the material and perceived themselves to learn more than students that worked individually. However, students who worked individually outperformed students that collaborated before working individually. (Leidner and Fuller, 1997) One solution to the problems of the collaboration of large groups may be to use a discourse structure or template, a different template for each category of topic (Turoff et al., 1999). Only available in CMC, this technique may allow the teacher to match the kinds of knowledge under consideration to the template. Each kind of knowledge may be acquired in a different structure of interactive discussion. The template selected by the teacher to organize the non-linear discussion can be tested for effectiveness and student satisfaction. Essentially the template allows students to pose 'questions', make statements and read the group's construction of common knowledge.

Individual Cognitive

There are two versions of constructionism extant among proponents. The 'developmental' theories from Piaget are the more traditional. They emphasize universal structures of knowledge to guide the making of meaning. In this version (individual cognitive) the individual student is the maker of personal knowledge. The second version of constructionism is seen in the situated social constructivist perspective, emphasizing social construction of knowledge. Here knowledge is seen as constructed by the individual's interaction with a social atmosphere (the situation), resulting in change for both the individual and the social group (Airasian and Walsh, 1997). Recognition of social and cultural influences on constructed knowledge is a primary emphasis discussed below.

Socio-cultural

Vygotsky stated that learning takes its source from a social environment (Scheurman, 1998) and thus individual cognition is derived from socio-cultural interaction with a group of peers and teachers in a joint construction of knowledge. This non-linear learning is a construction through self-discovery in the group context. Learning is by 'leaps and bounds' rather than incremental developmental steps as proposed by Piaget. In Vygotsky's view, students interact in a social setting to negotiate meaning. The individual student develops his own meaning while interacting with others. Students will contribute to a democratically derived result. The classroom should be an egalitarian setting, to be facilitated by the teacher. Students should participate in the development of the curricula and class rules (Jaramillo, 1996) (Airasian and Walsh, 1997).

Social Presence in CMC

Social presence is the degree to which a medium is perceived as conveying the presence of the communicating individuals (Short et al., 1976). Social presence theory is related to media richness theory (Daft and Lengel, 1986) in that both predict the effect of medium choice in the communication of information. "The essential underlying principle in both theoretic traditions is that a good match between the characteristics of a medium (such as high in social presence or media richness) and one's communication activities (such as socio-emotional activities like getting to know someone, or equivocal tasks like strategic decision making) will lead to 'better' (more effective, satisfying, etc.) Performance" (Rice, 1993 p453).

Short, et al. (1976) reviewed and conducted social psychological surveys and experiments that suggested how media might influence such aspects as the subjective presence of others, conformity, feedback, information transmission, bargaining, persuasion, problem solving, cooperation, conflict resolution, perception of others, getting to know someone, idea generation, and group cohesion. Finally, they concluded with a set of activities justified by this prior research as likely to be affected by differences in a medium's social presence: exchanging information, problem solving and making decisions, exchanging opinions, generating ideas, persuasion, getting the other on one's side of an argument, resolving disagreements or conflicts, maintain friendly relations/staying in touch, bargaining, and getting to know someone (Rice, 1993).

Presence as social richness is the extent to which a medium is perceived as sociable, warm, sensitive, personal or intimate when it is used to interact with other people. The social presence ranking thus depends on the interaction of the medium and the task at hand and is based upon the subjective judgment of the user. Presence as social richness is related to two important concepts originally applied to non-mediated interpersonal communication: Intimacy and immediacy. Because it is a perceptual illusion, presence is a property of a person. However it results from an interaction among formal and content characteristics of a medium and characteristics of the media user, and therefore it can and does vary across individuals and across time for the same individual. Presence in general is thought to have an intensifying effect on media users, increasing or enhancing enjoyment, involvement, task performance and training, desensitization, persuasion, memory/socio-emotion, and para-social interaction. (Lombard and Ditton, 1997)

Swift Trust in Temporary Teams

"... from where is trust imported to global virtual teams (online class), and how is trust maintained via electronic communication?" (Jarvenpaa and Leidner, 1998, p.6)

Meyerson, et al. (1996) developed the concept of swift trust to study temporary teams, those whose existence is finite and who are faced with a common task. Such teams (classes) are formed of individuals with diverse skills apropos to the task (subject studied) and limited history of working together, moreover with little prospect of working together in the future. The students work under time pressure and have limited time to develop relationships. Because of the limited time to exchange expectations of others, individuals bring expectations from previous experience. The individual's first impression forms a stereotypical impression of others in the class. From that stereotype swift trust is established at a level that will never again be exceeded. Too low a level causes students to drop the course, too high a level and students are destined to be disappointed.

After the initial interaction, trust is maintained by active, proactive, enthusiastic, generative style of action on the part of all participants including the teacher. Action maintains trust in a self-fulfilling manner, such that, action itself will maintain members' confidence that the group will be able to resolve the uncertainty and vulnerabilities. Whereas trust is traditionally based upon relationships, swift trust de-emphasizes interpersonal dimensions and instead is initially based upon broad categories of social structure and later on action, in this case communication. Since class members initially import trust rather than develop

trust, the level of trust may reach its peak at the start of the class (Meyerson et al., 1996). It is the teacher as facilitator/collaborator who can provide the continuous support of trust in the class. Asynchronous learning networks with 24/7 discussions are especially useful for this task. Continuity of interaction is seemingly achieved in the CMC.

The theory of swift trust assumes team members have clear role divisions. Inconsistent role behavior, such as CMC 'flaming', or the blurring of roles, such as assuming a pedantic role, erodes trust. The theory assumes that individuals come from many backgrounds, have periodic synchronous meetings, and report to one individual (the teacher). Teams that establish trust early are more likely to be able to handle uncertainty and complexity. It seems that first impressions count. The establishment of swift trust is likely to lead to increased instances of expression of commitment and excitement. The expression of such statements increases the attraction to the group, likelihood of agreement, and cooperation. However, the theory of swift trust discounts member support and group-well-being as unnecessary. This is because those are needed to develop trust beyond the initial level. Jarvenpaa and Leidner (1998) suggest instead that the theories of swift trust and group interaction theory are complementary in that one follows the other temporally.

Trust may be imported, but it is more likely to be created via a communication behavior established in the first few keystrokes. Communication that discusses the task (course subject) appears to be necessary to maintain trust. Social communication that complements, rather than replaces task communication strengthens trust. The comment-responding behaviors of participants, swift and supportive, are as critical as initiating behaviors. Members have to verbalize their commitment, excitement, and optimism.

Instructional Model

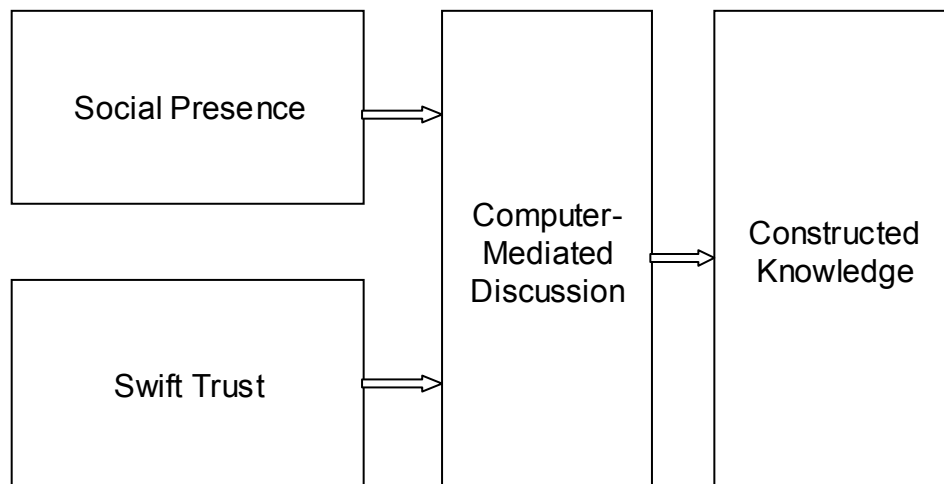


Figure 1. CMC Contribution to Constructivist Learning

Social presence and swift trust are the socio-contextual drivers of the virtual classroom® that lead to online construction of knowledge. The model shown in figure 1 depicts the theory of social presence as contributing to the discussion as it predicts by encouraging the individual to perceive interaction with fellow students as enjoyable and valuable. Swift trust theory predicts that the group as first assembled online will expect reciprocal effort and open discussion from the previously unknown fellow students. The persuasive and frank discussion of the subject studied enables students to exchange ideas and previous experiences to construct knowledge upon the common denominator of the group.

The model proposes that the theories of Social Presence and Swift Trust describe how to modify the online class discussion's socio-emotional tenor. The instructor can use techniques and modalities to increase these ingredients as needed to achieve the interaction desired. Asking for comments that are social in nature such as introductions or current topics lead to giving permission to be more informal. Requiring students to submit shorter but more frequent comments adds conversational quality to the discussion. Scheduling a regular synchronous chat sessions on specific topics will give realism to class 'attendance' and contact. Other techniques are to be found in the instructor's bag of tricks. The earlier that the class is submerged into cooperative interaction the more the initial trust is maintained and exploited. Students arrive in the class expecting to participate and interact

collaboratively. The initial experience is their swift trust in that expectation. Instructors can build on that expectation to facilitate group construction of knowledge.

How can this model be validated? In an ongoing field study of online classes at NJIT, the discussion transcripts are analyzed for levels of Social Presence and Swift Trust through the coding of extracted phrases. Manipulating communication mode modulates these elements of the discussion. The study asks instructors to add some synchronous communication to the mostly asynchronous computer-mediated communication to encourage the socio-emotional content of the discussion. Instructors that use artifice techniques can increase the socio-emotional content of the discussion as well. These variations of the 'independent' variables are hypothesized as causally related to the level of constructed knowledge.

To measure the outcomes of the learning experience the students are surveyed for their perceptions of knowledge gained and the value of the class. The purpose is to elucidate distinction between 'this' class and others including face-to-face traditional classes. The instructors are interviewed using open-ended questions and a small survey similar to the students' survey. It is well known that the biggest contributor to success of a class is the instructor's skill. But instructors and students can well determine in hindsight how the class functioned, well or poorly, and how much was learned by both.

Conclusion

Asynchronous CMC will contribute less to social presence levels than synchronous CMC. That is the hypothesis posited by media richness theory (Daft and Lengel, 1986) and in this paper. A social presence will be enhanced in the perception of the user/student when immediate feedback is available in the CMC. So the ratio of synchronous to asynchronous CMC used in the class we expect to be correlated to the level of social presence and thus the construction of learning.

It can be seen that the indicators of social presence, such as enjoyment, involvement, persuasion, etc. are also among indicators that constructive learning is taking place. Swift trust supports collaborative teamwork through participant trust in the initial action and thus direction of the group. The simple fact of the discussion existing as an inviting place to visit (and work) generates interaction and constructive learning. In general the unique nature of CMC has the potential to serve as an enhanced constructive context.

The field study is underway to validate this model with eight classes so far completed. Results are not completely recorded but anecdotal evidence is encouraging. Students that meet face-to-face in some classes are also better 'communicators' online. The instructors who have tried synchronous sessions online have not been that successful getting many of the class members to participate. That said the instructors do not seem discouraged that some form of synchronous medium in their asynchronous mostly classes will promote better interaction and understanding. As the communication mode used in online classes is constantly changing this study can never be complete. The methods used to promote knowledge construction in students will be evaluated and general truths will be uncovered by instructors and researchers alike.

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